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U. S. DEPARTMENT OF AGRICULTURE

# BLACKLEG

## *of Cattle*



Leaflet No. 420

U. S. DEPARTMENT OF AGRICULTURE

Blackleg is an acute infectious disease that affects mainly young cattle and sometimes sheep. It is known also as black quarter, quarter ill, symptomatic anthrax, and emphysematous anthrax. Most animals die within 12 to 36 hours after the first symptom appears.

### CAUSE OF BLACKLEG

The blackleg bacillus,<sup>1</sup> or micro-organism, lives as a spore in pasture soil. It is hard to kill, and can survive, particularly in low, swampy land, for many years. Heat, cold, drying, and disinfectants have little effect on it. It belongs to the class of bacteria known as anaerobes—that is, it grows only in the absence of oxygen.

Blackleg bacilli probably enter puncture wounds caused by thorns, briars, stubble, burs, or barbed wire. In sheep, the germs may enter cuts caused by docking or shearing. Sometimes, gum sores from erupting teeth also allow the germs to enter. Healthy animals cannot be infected merely by contact with a diseased one.

<sup>1</sup> *Clostridium chauvoei*.

### SYMPTOMS

An animal infected with blackleg has a high fever (105° to 107° F.). Gaseous swellings form under its skin. These swellings usually are on the hips or shoulders where they cause stiffness, lameness, or even paralysis. They may appear on the neck, chest, flank, or rump. The swellings are small, hot, and painful at first, but enlarge and become cool and painless. An infected animal loses its appetite, stops chewing its cud, breathes rapidly, and becomes depressed. Just before death, its temperature falls and violent convulsions may develop.

The disease progresses so suddenly that you will usually find the first animals affected in a new outbreak dead in the pasture before you notice any of these symptoms.

### APPEARANCE OF ANIMAL AFTER DEATH

Within a few hours after an animal dies from blackleg, its legs stick straight out from the bloated carcass. Blood-colored foam has been forced from its mouth, nostrils, and



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Yearling dead of blackleg. Note swollen left hind leg and characteristic "propped up" appearance of legs.

anus. Pressing on the gaseous swellings causes a crackling noise. If you cut into these swellings, a frothy, dark-red fluid that smells like rancid butter is released. Muscle tissue is blackened and streaked with dark-red areas—hence the name, blackleg. Body lymph glands draining the area may be enlarged and inflamed. Body cavities may contain a bloody fluid, but internal organs usually show little change.

As you examine the carcass, it is difficult to keep body fluids from contaminating the barn or pasture; use extreme care, and disinfect the barn or burn over the contaminated area of the pasture.

### DISTRIBUTION

Blackleg is found nearly everywhere in the United States and over most of the world. It is prevalent and causes greatest losses in the central and far western States. Here are found so-called blackleg districts—the soil is heavily contaminated with blackleg organisms.

Spring and fall are seasons most favorable for the development of blackleg but the disease may appear at any time. The infection appears to be more prevalent on wet bottom land than in hilly areas, but it may occur on any terrain.

Cattle that are 6 to 18 months old are most susceptible to blackleg. Suckling calves under 4 months old and cattle past 2 years old are rarely affected. Cattle of improved breeding and fat, thrifty calves and yearlings usually are first to develop the disease. Common stock and thin, scrubby, or stunted calves appear to be more resistant and seldom are infected. Sheep, goats, and hogs occasionally contract the disease, but man, horses, dogs, cats, and fowl appear to be immune. Guinea pigs are highly susceptible and are used in laboratory diagnostic tests.

### DISEASES THAT LOOK LIKE BLACKLEG

Diagnosis of blackleg is based on history, clinical symptoms, post-mortem examination, and laboratory examination of specimens from animals suspected of having the disease. In known blackleg districts, blackleg infection should be suspected when calves and yearlings die suddenly on pasture and show gassy swelling of the muscles or when sheep show symptoms of the disease after docking and shearing.

Since blackleg may be mistaken for malignant edema, anthrax, hemorrhagic septicemia, sweet-clover poisoning, and other abnormal conditions, a laboratory examination of tissue specimens should be made to find the causative organism.

While laboratory tests are the only conclusive way to distinguish blackleg from other infectious diseases, following are some points of difference:

- Malignant edema closely resembles blackleg and is often confused with it. However, malignant edema affects cattle of all ages, as well as horses, sheep, swine, and man. It generally starts from a noticeable wound, and the gangrenous swellings appear on the head, throat, belly, briskets, and other parts of the body subject to puncture wounds. The swellings develop rapidly and are usually extensive and doughy, pit on pressure, and when opened discharge a reddish gelatinlike substance mixed with gas bubbles.

- In anthrax, the spleen is usually dark red, enlarged, and soft. Bloody discharges from the natural body openings are common. The blood is darker than in blackleg and does not clot readily. The hot, painful swellings that sometimes occur contain a clear or somewhat blood-tinged gelatinous fluid, but not gas. Natural postmortem stiffening of the muscles (*rigor mortis*) is retarded or incomplete.

- Hemorrhagic septicemia affects cattle of all ages. The swellings that are found on the throat, neck, and dewlap are soft and doughy, without gas bubbles. Hemorrhages are distributed throughout the body.

## CONTROL

To control blackleg outbreaks, isolate and treat all animals showing early symptoms of the disease. Vaccinate apparently normal but exposed animals and, if possible, immediately move them to a new pasture on higher ground. Promptly dispose of dead animals by complete burning or deep burial in quicklime. Burn manure, bedding, and other contaminated material. Clean and disinfect contaminated stables.

You can reduce the incidence of blackleg infection by following practices that insure cleanliness and freedom from contamination. See that animals have clean feed, water, and quarters, and keep them in uncontaminated pastures.

Do not skin dead animals, feed the carcass to other animals on the farm, or take the carcass to a rendering plant.

When you suspect an outbreak of blackleg, promptly notify your veterinarian or the State livestock sanitary official.

**TREATMENT.**—Treatment is of little or no value in an advanced case of blackleg. Veterinarians report that antibiotics such as aureomycin, terramycin, and penicillin give excellent results in animals showing early symptoms of the disease. The Department of Agriculture has not studied the value of antibiotics in the treatment of blackleg. The use of antibiotics should be left to the judgment and skill of a veterinarian.

**VACCINATION.**—Vaccination is the only effective and reliable means we know for protecting animals against blackleg. Before the first vaccine was developed in France in 1883, 20 percent of the calves in badly contaminated districts died of blackleg.

From 1897 to 1922, the Department of Agriculture prepared and distributed free about 47,000,000 doses of vaccine. During this 25-year period, losses from blackleg were reduced from 10 percent to less than  $\frac{1}{2}$  of 1 percent. Free distribution of vaccine was discontinued in 1922 in compliance with an act of Congress.

During the past 60 years, many improvements have been made in blackleg vaccine. Blackleg bacterin, a highly effective immunizing agent, is now used extensively. It has not replaced all the old vaccines, however. Powder, pills, filtrate, and aggressin are still used.

Blackleg bacterin and other types of vaccine, used according to directions, usually produce a high degree of immunity in 10 to 12 days. Immunity lasts 9 to 12 months or longer. Since young calves may not develop lasting immunity, all animals under 4 months of age when vaccinated in the spring should be revaccinated in the fall. In areas where the disease is prevalent, some cattle owners vaccinate all new additions to the herd.

Antiblackleg serum is sometimes used for immunizing highly valuable calves exposed in outbreaks. This product immediately increases the animal's resistance to blackleg, but immunity lasts only about 2 weeks.

In blackleg districts where the soil is believed also to be contaminated with the organism that causes malignant edema infection, a bivalent or mixed bacterin containing both organisms, *Clostridium chauvoei-septicus* bacterin, is used.

Prepared by Animal Disease and Parasite Research Division, Agricultural Research Service. This publication supersedes Farmers' Bulletin 1355, Blackleg: Its Nature, Cause, and Prevention.

Washington, D. C. Issued October 1957